POWER WINDOW SYSTEM

■DESCRIPTION

- The power window motor of the ’07 ES350 contains an ECU. The ECU effects power window control. The power window system has the following functions:

Function	Outline
Manual up-and-down (All Doors)	This function causes the window to open or close while the power window switch is being pulled halfway up or pushed halfway down. The window stops as soon as the switch is released.
One-touch auto up-and-down (All Doors)	The one-touch auto up-and-down function enables the window to be fully opened or closed with a single touch of the power window switch.
Jam Protection (All Doors)	A jam protection function automatically stops the power window and moves it downward if a foreign object gets jammed in the window during one-touch auto-up operation or manual up operation.
Remote Control (All Doors)	The power window master switch can control the up-and-down operations of the windows.
Window Lock	Power window operation of the 3 passenger windows is disabled when the window lock switch is pressed.
Key Off Operation	This function makes it possible to operate the power windows for approximately 43 seconds after the power source is turned to OFF, if the driver’s door is not opened.
Key-linked up-and-down function*[1]	When the key is not in the interior detection area, the driver’s door is locked, and the key in the driver’s door is turned and maintained in the lock direction for 1.5 seconds or more, the main body ECU activates the power window motor to raise all door windows while the key is turned. Similarly, when the driver’s door is unlocked, turning and maintaining the driver’s door key in the unlock direction for 1.5 seconds or more will cause all door windows to be lowered.
Transmitter-linked up-and-down function*[1,2]	When a lock/unlock signal is transmitted by the transmitter for longer than 2.5 seconds to the certification ECU, the certification ECU transmits the window close/open signal to the main body ECU. Power window ECUs activate all the power window motors in accordance with the signals from the main body ECU to open or close all the windows.
Lock switch-linked up function	All the windows are closed when the lock switch on the outside door handle is pressed for 3 seconds or more with the key in the detection area and all the doors locked. This function can be performed using the door lock switch of any door.
Diagnosis	When any power window ECU detects the following conditions, the self-diagnosis function switches the ECU to failsafe mode. The power window switch illumination (LED) flashes to inform the user. ● An abnormality in the Hall IC that detects the position, speed and direction of the window. ● An error in the window detection position and the upper limit position recorded in the power window ECU.
Fail-Safe	If the Hall IC in the power window motor malfunctions, some power window functions will be prohibited by the failsafe mode: ● Power windows can be operated using the power window switches within 40 seconds of failsafe mode being entered. ● Each power window operates when the corresponding power window switch is fully pushed down or pulled up and held in that position.

*[1]: The setting function can be changed using the customized body electronics system. For details, refer to Customized Body Electronics System section on page BE-14.

*[2]: Only the down function is available on U.S.A. and Canadian package models.

Service Tip

The power window motor assembly stores the initial position of each door window. The memory is not cleared if battery terminals, fuses or power window motor assembly connectors are disconnected. However, after the power window motor assembly and power window regulator assembly are replaced, the stored initial position data must be cleared and the initialization of the power window motor assembly must be performed. When necessary, perform the initialization as follows:

Initial Position Memory Erasure Procedure

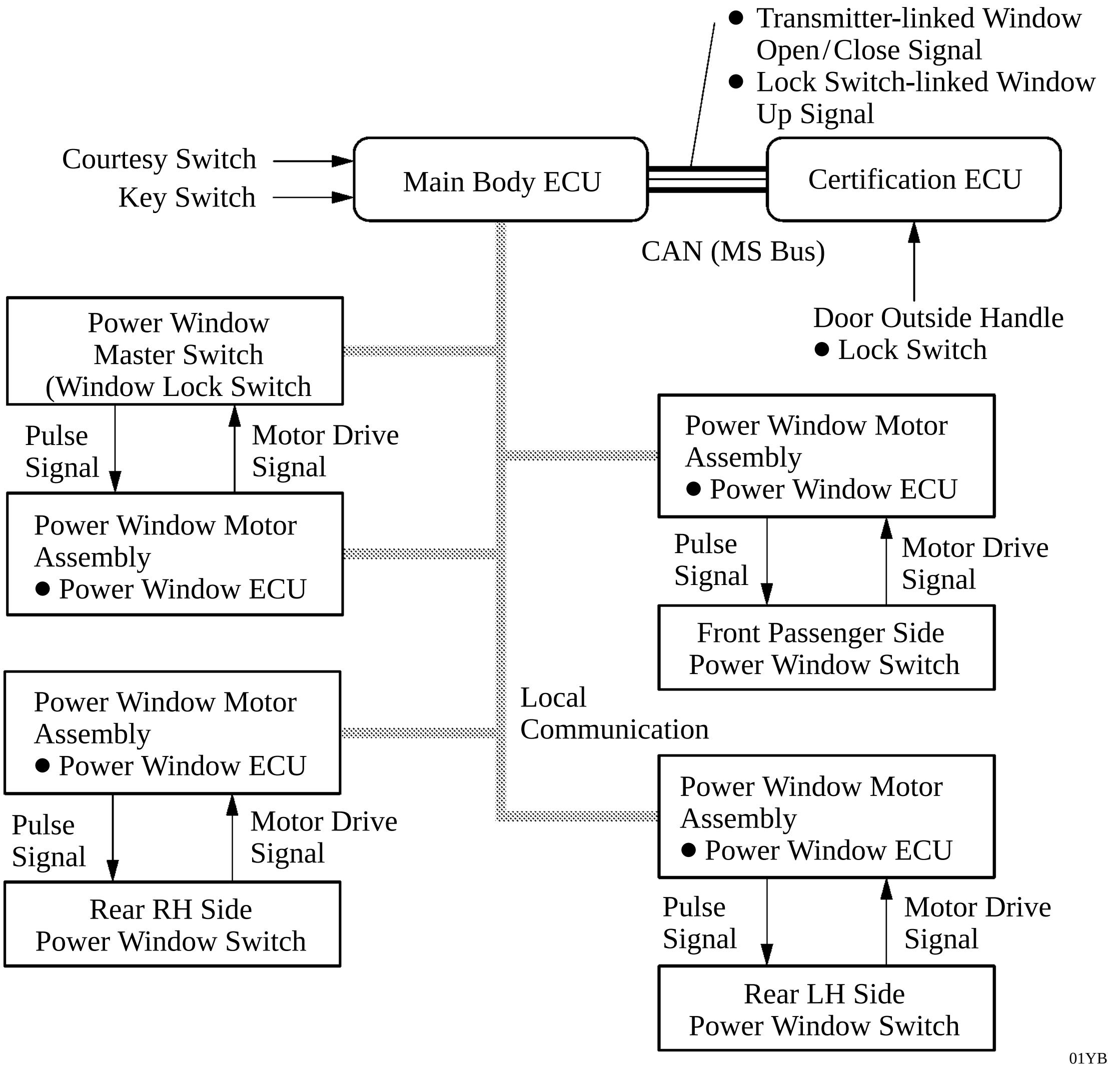
- Turn the power supply off (for example, remove a power window motor assembly connector or fuse) while the power window motor is operating.
- Check that the power window switch illumination blinks after the power source is turned on.

Initialization procedure

- Pull up the power window switch to the AUTO UP position and hold it until the window is fully closed.
- Hold the power window switch in the AUTO UP position for at least 1 second after the window is fully closed.
- Make sure that the window opens and closes automatically using the one touch function.

For details, see the 2007 LEXUS ES350 Repair Manual (RM01Y0U).

▶ System Diagram ◀



● Transmitter-linked Window Open/Close Signal
● Lock Switch-linked Window Up Signal
Courtesy Switch
Key Switch
Main Body ECU
Certification ECU
CAN (MS Bus)
Door Outside Handle
● Lock Switch
Power Window Master Switch (Window Lock Switch
Pulse Signal
Motor Drive Signal
Power Window Motor Assembly
● Power Window ECU
Power Window Motor Assembly
● Power Window ECU
Pulse Signal
Motor Drive Signal
Front Passenger Side Power Window Switch
Power Window Motor Assembly
● Power Window ECU
Pulse Signal
Motor Drive Signal
Rear RH Side Power Window Switch
Local Communication
Power Window Motor Assembly
● Power Window ECU
Pulse Signal
Motor Drive Signal
Rear LH Side Power Window Switch

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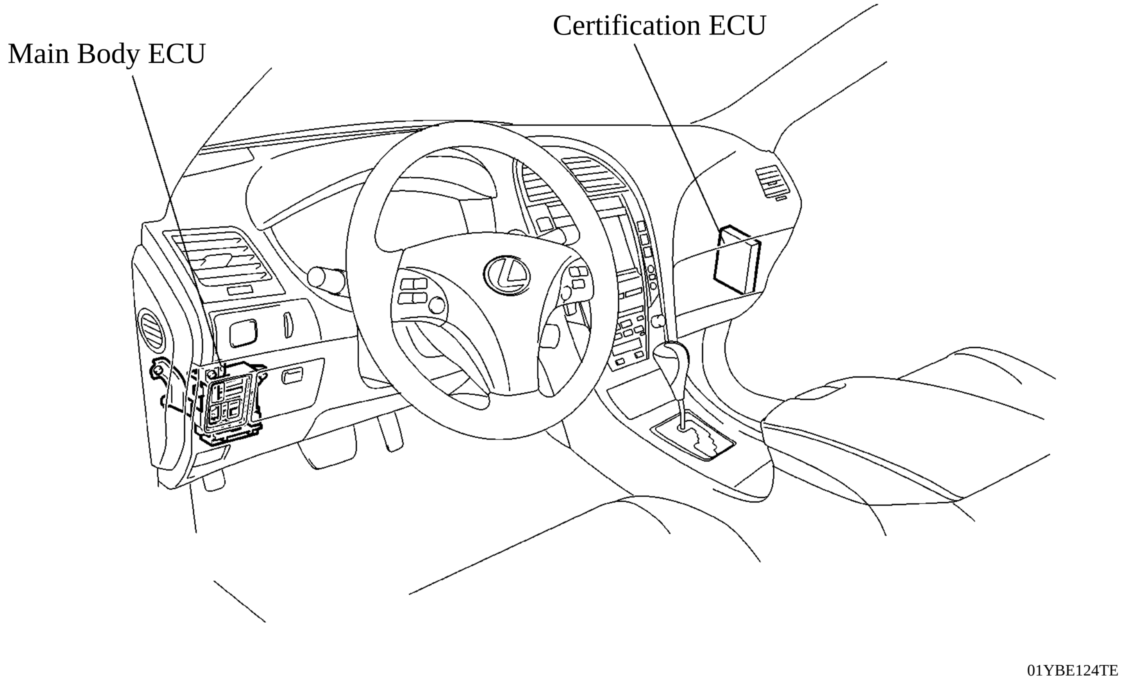
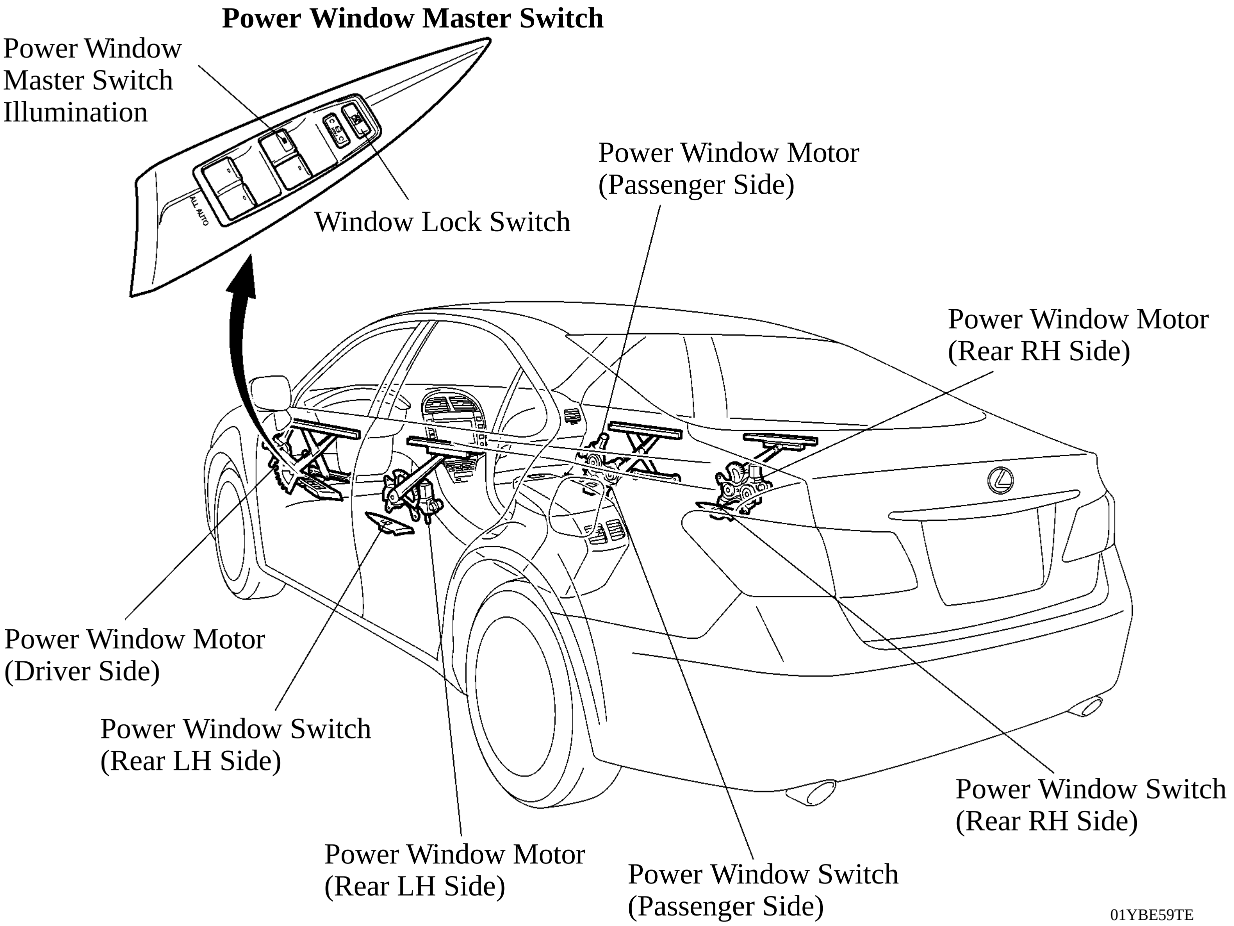
■LAYOUT OF MAIN COMPONENTS



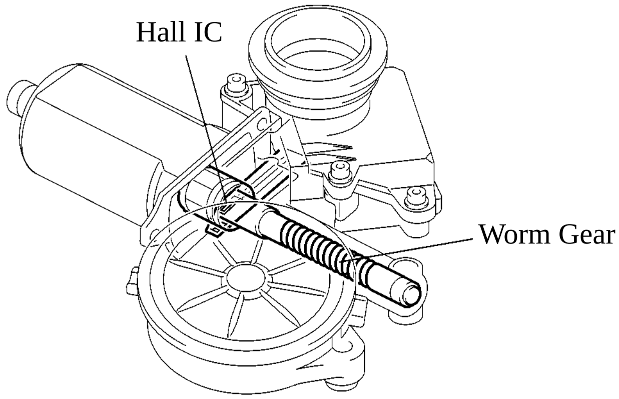


■JAM PROTECTION FUNCTION

- A jam protection function automatically stops the power window and moves it downward if a foreign object gets jammed in the door window during one-touch auto up operation.
- The operation of the jam protection function is described below.

Door window distance from fully closed position	Operation
200 mm (7.87 in.) or more	Down operation of 50 mm (1.97 in.) or one second.
200 mm (7.87 in.) or less	Down operation until door window operation of 200 mm (7.87 in.) is reached or five seconds.

- The worm gear and Hall IC in the power window motor assembly are used to enable the power window jam protection.



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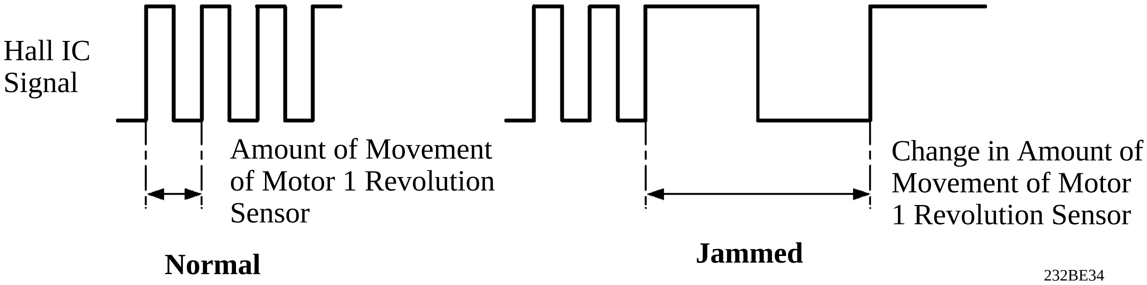
- The Hall IC converts the changes in the magnetic flux that occur through the rotation of the worm gear into pulse signals and outputs them to the power window master switch or power window switch.
- To control the jam protection function, these switches determine the amount of movement and jamming of the window glass based on the pulse signals from the Hall IC.

▶ Judgment of Movement and Jamming ◀


Hall IC Signal
Amount of Movement of Motor 1 Revolution Sensor
Normal
Change in Amount of Movement of Motor 1 Revolution Sensor
Jammed

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